

Name _____

Oil Spill Cleanup

Major Oil Spills

- The world's largest oil spill occurred in June 1979, when an oil well blew out off the east coast of Mexico and spilled about 130 million gallons of oil.
- The world's worst tanker oil spill occurred in March 1978, when a tanker ran aground off the coast of France, spilling 68 million gallons of oil.
- The worst oil spill in the United States occurred in March 1989, when a tanker ran aground off Alaska and leaked more than 10 million gallons of oil.

What would you use to clean up an oil spill? Explain your suggestion below.



Traditional oil spill cleanup methods

1. A ring of floating devices is placed around the spill to prevent it from spreading. Pumps or skimming devices then collect the oil which floats on the surface of the water.
2. Sheets or particles of floating oil-absorbing material such as sawdust and spun fabrics can be used to recover spilled oil.
3. Burning the oil cleans up a spill.
4. Detergents help break up spills.
5. High pressure hoses with 140° F water heated on barges are used to blast oil from the surface of the rocks.

What do you think are some of the disadvantages or drawbacks of the above methods?



Enviro-Bond™ 403

A new form of hydrocarbon stabilization polymer technology is changing the way environmental scientists approach oil spill and waste management problems. Oil is a major source of groundwater contamination and ocean pollution. The vast majority of this oil enters the ocean from oil spills on ships that transport petroleum or from manufacturing operations on land. However, oil can also seep into the ocean naturally from cracks in the sea floor. Oil well and oil tanker accidents at sea account for a small portion of ocean oil pollution, yet the lasting effects of these accidental spills can be disastrous.

This incredible oil stabilizing polymer is called **Enviro-Bond™ 403**. It is specially formulated to bond quickly and safely to many types of liquid hydrocarbons including crude oil, diesel fuel, and gasoline. The bonding is so complete that it literally encapsulates the liquid hydrocarbons in just minutes. When the **Enviro-Bond™ 403** polymer comes in contact with a liquid hydrocarbon, the free hydrocarbons bond to the polymer forming a semi-solid mass. The hydrophobic properties of the polymer cause it to float on water, but the density of the polymer is great enough to allow it to sink through the hydrocarbon and maximize the bonding potential. **Enviro-Bond™ 403** is also used in treating oily sludge, effectively filtering oil drilling fluids, and stabilizing any other spilled or leaked liquid hydrocarbons that pose a threat to the environment.

Enviro-Bond™ 403 cannot be classified as a superabsorbent polymer. By definition, a superabsorbent polymer will absorb 25 times its weight on a weight-to-weight ratio. Therefore, **Enviro-Bond™ 403** does not qualify as a superabsorbent polymer. Instead, it is classified as a hydrocarbon stabilization polymer. However, a fast-acting superabsorbent polymer, such as sodium polyacrylate, can be used in conjunction with the oil polymer. Sodium polyacrylate has no affinity for liquids hydrocarbons and **Enviro-Bond™ 403** polymer does not bond to the water.

Describe the impact you think **Enviro-Bond™ 403** will have on our man-made environmental problems.



Demonstration #1: The Stabilizer

1. Draw and label the beaker of water and mystery oil below.
2. Describe the oil-polymer mixture below.
3. Describe the appearance of the water after the **Enviro-Bond™ 403** has been added.

Demonstration #2: Superabsorbent polymers

4. What happened inside the beaker when the sodium polyacrylate was added?
5. What is the difference between a superabsorbent polymer and a hydrocarbon stabilization polymer?
6. How can **Enviro-Bond™ 403** be used in conjunction with the sodium polyacrylate to clean up oil spills?